

Restoration of Doukaiwan

Doukaiwan, once called “dead sea” as fish was hardly seen due to the unprocessed plant wastewater from Kitakyushu industrial area surrounding the coast, has restored its sea ecology to a level to restart prawning, thanks to the industry-government-academia-people united efforts including “plant wastewater regulations”, “sewage system development,” and “polluted sediment dredging.”

◆ Key to Restoration

- Plant wastewater regulations, sewage system development, and polluted sediment dredging.
- Ecological environment repair (bioremediation)
- Doukaiwan as a symbolic relaxation place for “Kitakyushu City’s ecological improvement”

◆ Overview of the Bay

Doukaiwan, stretching from east to west, with 1.2 km-entrance and 13 km-depth, is in Kitakyushu City, Fukuoka Prefecture. Locating at the center of heavy and chemical industry area, it was a “dead sea” as fish was hardly seen due to the unprocessed plant wastewater from the surrounding plants, and was called as “the worst polluted sea in Japan” that was “never restorable.”



◆ Project Efforts for Restoration

[First period]

In 1966, Kitakyushu City conveyed the first scientific research on Doukaiwan’s water that colored dark red or dark yellow. The research revealed that the dissolved oxygen (DO) amount was 0 mg/liter. Shocked with the data, Kitakyushu City and the citizens submitted a petition to the government for research. In 1970, the government defined the bay as designated water body, and strong wastewater regulations started. As a result, the water quality improved greatly from 1971. Polluted sediment dredging started in 1974, and prawning has restarted in 1983. Various creatures have been found to have returned to the bay.

[Second period]

Thanks to the efforts, the water quality has restored to an inhabitable level, but the bay is still eutrophic and fish dies due to red water and lack of oxygen. Current efforts are on water purification using natural life. Common mussels, a dominant species in the bay, is used in experimentation: they eat eutrophication-increased phytoplankton; mussels are harvested after they grow; nutrient salts are removed from water. This is an environment-friendly water purification method using common mussels’ ecological characteristics.



Plant-wastewater polluted Doukaiwan (1960s)



Purified and revitalized Doukaiwan (today)